

REPLY

To: Examiner of the Patent Office

1. Identification of the International Application: PCT/JP2005/001808

2. Applicant

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4. Date of Notice May 31, 2005

5. Subject Matter of Reply

Please amend the Claims as follows.

Claims

1. (Amended) A fire resistant fiber sheet characterized by fire retardant capsules covered with a synthetic resin film, to adhere said capsules to said fiber sheet, wherein a sulfomethylated and/or sulfimethylated phenolic resin is added to said fiber sheet in an amount of between 5 and 200% by mass.
2. (Amended) A fire resistant fiber sheet in accordance with Claim 1, wherein said fire retardant capsules are added to said fiber sheet in an amount of between 5% and 80% by mass.
3. (Amended) A fire resistant fiber sheet in accordance with Claim 1, wherein said flame retardant is water soluble and said synthetic resin film is water insoluble.

4. (Deleted)
5. (Amended) A fire resistant fiber sheet in accordance with any of Claims 1 to 3, wherein said fibers are all hollowed, or a mixture of solid and hollowed fibers.
6. (Amended) A fire resistant fiber sheet in accordance with any of Claims 1 to 5, wherein an additional fiber having a low melting point of below 180°C is mixed in with said fiber.
7. (Deleted)
8. (Deleted)
9. (Deleted)
10. (Deleted)
11. (Deleted)
12. (Deleted)
13. (Deleted)
14. (Deleted)
15. (Deleted).
16. (Amended) A molded article wherein said fire resistant fiber sheet in accordance with any of Claims 1 to 6, is molded into a prescribed shape.
17. A molded article in accordance with Claim 16, wherein a ventilation resistance of said molded article is in the range of between 0.1 and 100kPa·s/m.
18. (Amended) A laminated material wherein other porous sheet(s) is (are) laminated onto one side or both sides of said fire resistant fiber sheet in accordance with any of Claims 1 to 5.
19. (Amended) A laminated material in accordance with Claim 18, wherein other porous sheet(s) is (are) laminated onto one or both sides of said fire resistant fiber sheet through thermoplastic resin film(s) having a thickness of between 10 and 200μm.
20. (Amended) A laminated material in accordance with Claim 19, wherein a hot melt adhesive powder is scattered onto one or both sides of said fire resistant fiber sheet in an amount of between 1 and 100g/m² and said other porous material sheet(s) is (are) laminated onto said fiber sheet through said scattered layer of hot melt adhesive powder.
21. (Amended) A molded article wherein a laminated material in accordance

with Claims 18, 19 is molded into a prescribed shape.

22. A molded article in accordance with Claim 21, wherein a ventilation resistance of said molded article is in the range of between 0.1 and 100 kPa·s/m.

23. (Amended) A fire resistant acoustic material for cars made of a molded article in accordance with any of Claims 16, 17, 21 and 22.

The gist of said amendment is the choosing of a porous material fiber sheet and the addition of a sulfomethylated or sulfimethylated phenolic resin to said fiber sheet as a binder.

In a case where said phenolic resin is sulfomethylated and/or sulfimethylated, the wide range of stability of said phenolic resin water solution, from acidity to alkalinity, is improved (see paragraph 2 in page 12 and paragraph 2 in page 16 in Specification).

Reference 1 (JP9-13037A) discloses the capsulated flame retardant and Reference 2 (JP11-323015A) discloses the flame retardant's structure wherein a fire retardant in a microcapsule is covered with a fiber cloth, but does not disclose the use of a sulfomethylated and/or sulfimethylated phenolic resin as a binder.

Reference 3 (JP2003-234271 A) and Reference 4 (JP2000-327797 A) disclose the use of a sulfomethylated and/or sulfimethylated phenolic resin as a binder for said fiber, but do not disclose that said flame retardant capsules are adhered to said fiber.

In the present invention, for easy handling, a water soluble resin is selected as a synthetic resin binder, so that water soluble flame retardant is covered with water insoluble synthetic resin film. Further, to secure the wide range stability from acidity to alkalinity of said water solution of water soluble resin, said phenolic resin is sulfomethylated and/or sulfimethylated.

Accordingly the present invention in amended Claim 1 could not easily have been made from the disclosures in References 1 to 4, so that the present invention has novelty and an inventive step.

6. List of attached documents

Amendment

AMENDMENT
(Amendment based on Article 11)

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4. Items to be amended Specification, Claims and Abstract

5. Subject Matter of Amendment

- (1) The expression "FLAME-RETARDANT POROUS SHEETS" on page 1, line 1 should be amended as "FIRE RESISTANT FIBER SHEET".
- (2) The expression "the present invention provides a porous fire resistant sheet characterized by a synthetic resin film covering fire retardant capsules, causing said fire retardant capsules to adhere to porous material." on page 2 line 7 to 10 should be amended as "the present invention provides a fire resistant fiber sheet characterized by fire retardant capsules covered with a synthetic resin film, to adhere said capsules to said fiber sheet, wherein a sulfomethylated and/or sulfimethylated phenolic resin is added to said fiber sheet in an amount of between 5 and 200% by mass."
- (3) The expression "porous material" on page 2, line 11 should be amended as "fiber".

- (4) The expression "porous material" on page 2, line 13 should be amended as "fire resistant fiber sheet".
- (5) The expression "It is desirable that synthetic resin binder be contained in said fiber in an amount of between 5 and 200 % by mass for fibers. It is also desirable that said synthetic resin binder be a water solution, and that water soluble resin be dissolved in said water solution. It is desirable that said synthetic resin binder be a phenolic resin, and that said phenolic resin be sulfomethylated and/or sulfimethylated.—Furthermore,—it is—desirable that said porous material be an expanded synthetic resin, and that synthetic resin binder be contained in said expanded synthetic resin in an amount of between 5 and 200% by mass for said expanded synthetic resin. It is desirable that said synthetic resin binder be a water solution. It is desirable that water soluble synthetic resin be dissolved in said water solution. It is desirable that said synthetic binder be a phenolic resin, and that said phenolic resin be sulfomethylated and /or sulfimethylated." on page 2, lines 16 to 28 should be deleted.
- (6) The expression "porous fire resistant sheet" on page 2, line 29 to 30 should be amended as "fire resistant fiber sheet".
- (7) The expression "other porous sheet(s) is(are) laminated onto one or both sides of said porous fire resistant sheet." on page 2, line 33 to 34 should be amended as "other fiber sheet(s) is(are) laminated onto one or both sides of said fire resistant fiber sheet."
- (8) The expression "porous fire resistant sheet" on page 3, line 2 should be amended as "fire resistant fiber sheet".
- (9) The expression "porous fire resistant sheet" on page 3, line 5 should be amended as "fire resistant fiber sheet".
- (10) The expression "When the porous fire resistant sheet of the present invention, which is a fire resistant fiber sheet, fire resistant expanded synthetic resin sheet, or the like" on page 3, line 16 to 17 should be amended as "When the fire resistant fiber sheet of the present invention".
- (11) The expression "porous fire resistant sheet" on page 3, line 20 should be amended as "fire resistant fiber sheet".

- (12)The expression "Said fire retardant capsules are particle like, and adhere to said porous fire resistant sheet so that said fire retardant capsules do not interfere with the ventilation property of said porous fire resistant sheet." on page 3, line 21 to 24 should be amended as "Said fire retardant capsules are particle like, and adhere to said fire resistant fiber sheet so that said fire retardant capsules do not interfere with the ventilation property of said fire resistant fiber sheet."
- (13)The expression "In particular, in a case where said porous fire resistant sheet is a fire resistant fiber sheet," on page 3, line 24 to 25 should be amended as "In a case of a fire resistant fiber sheet,".
- (14)The expression "said synthetic resin binder" on page 3, line 30 should be amended as "a sulfomethylated and/or sulfimethylated phenolic resin as a synthetic resin binder".
- (15)The expression "porous fire resistant sheet" on page 3, line 31 to 32 should be amended as "fire resistant fiber sheet".
- (16)The expression "Said porous fire resistant sheet of the present invention, such as a fire resistant fiber sheet, or fire resistant expanded synthetic resin sheet" on page 4, line 8 to 9 should be amended as "Said fire resistant fiber sheet of the present invention".
- (17)The expression "[Porous material] The porous materials used in the present invention are such as fiber, expanded synthetic resin or the like. In the present invention, said porous material is used as porous sheet such as fiber sheet, or expanded synthetic resin sheet, or the like." on page 4, line 19 to 23 should be deleted.
- (18)The expression "The fiber used in the present invention" on page 4, line 26 should be amended as "The fiber used in the fiber sheet of the present invention".
- (19)The expression "[Expanded synthetic resin] The expanded synthetic resin used in the present invention may include such as an expanded polyurethane having open cell (including soft type expanded polyurethane and hard type expanded polyurethane), an expanded polyolefin such as polyethylene, polypropylene, or the like, an expanded polyvinylchloride, expanded polystyrene, expanded

acrylonitrile-styrene-butadiene copolymer, an expanded amino group resin such as melamine resin, urea resin or the like, an expanded epoxy resin, expanded phenol group resin made of phenol group compound such as monohydric phenol, polyhydric phenol or the like. In the present invention, said expanded synthetic resin may be provided as said expanded synthetic resin sheet." on page 6, line 22 to 33 should be deleted.

(20) The expression "In the present invention, thermally expandable particles may be added to said porous fire resistant sheet such as said fire resistant fiber sheet, fire resistant expanded synthetic resin sheet, or the like." on page 8, line 6 to 8 should be amended as "In the present invention, thermally expandable particles may be added to said fire resistant fiber sheet."

(21) The expression "Synthetic resin binder is coated on or impregnated in to said porous sheet of the present invention, said sheet being for example, a fiber or expanded synthetic resin sheet, or the like." on page 9, line 33 to 34 and page 10, line 1 should be amended as "Synthetic resin binder is coated on or impregnated in to said fiber sheet of the present invention."

(22) The expression "Said synthetic resin used as the binder for said fiber sheet may include, for example, thermoplastic synthetic resins such as polyethylene, polypropylene, ethylene-propylene copolymer, ethylene-vinyl acetate copolymer, polyvinylchloride, polyvinylidenechloride, polystyrene, polyvinylacetate, fluoric resin, thermoplastic acrylic acid resin, thermoplastic polyester, thermoplastic polyamide, thermoplastic urethane resin, acrylonitrile-butadiene copolymer, styrene-butadiene copolymer, acrylonitrile-butadiene-styrene copolymer, ethylene-propylene copolymer, ethylene-propylene terpolymer, ethylene vinyl acetate copolymer, or the like; thermosetting resins such as urethane resin, melamine resin, heat hardening type acrylic acid resin, urea resin, phenolic resin, epoxy resin, a heat hardening type polyester, or the like, and further, a synthetic resin precursor which produces said synthetic resin such as a prepolymer, oligomer monomer, or the like

may be used. Said prepolymer, oligomer or monomer may include urethane resin prepolymer, epoxy resin prepolymer, melamine resin prepolymer, urea resin prepolymer, phenol resin prepolymer, diallylphthalate prepolymer, acrylic oligomer, polyisocyanate, methacryl ester monomer, diallylphthalate monomer, or the like. Said synthetic resin binder may be used singly, or two or more kinds of said synthetic resin may be used together, and said synthetic resin binder may commonly be provided as an emulsion, latex, water solution, organic solvent solution, or the like." on page 10, line 6 to 27 should be deleted.

(23)The expression "desirable" on page 10, line 28 should be deleted.

(24)The expression "may be" on page 10, line 33 should be amended as "is".

(25)The expression "desirably" on page 13, line 5 should be deleted.

(26)The expression "porous sheet such as a" on page 15, line 14 should be deleted.

(27)The expression "a porous fire resistant sheet, such as a fire resistant fiber sheet, fire resistant expanded synthetic resin sheet, or the like, each having greater fire resistance," on page 16, line 26 to 28 should be amended as "a fire resistant fiber sheet, each having greater fire resistance,".

(28)The expression "a porous sheet such as said fiber sheet, said expanded synthetic resin sheet or the like," on page 19, line 24 to 25 should be amended as "said fiber sheet,"

(29)The expression "said porous sheet is usually dipped into a liquid synthetic resin or" on page 19, line 25 to 26 should be amended as "said fiber sheet is usually dipped into".

(30)The expression "said liquid synthetic resin or" on page 19, line 27 should be deleted.

(31)The expression "in said porous sheet" on page 19, line 30 should be amended as "in said fiber sheet".

(32)The expression "especially in a case where said porous material sheet is a fiber sheet" on page 19, line 34 should be deleted.

(33)The expression "into said porous sheet, said porous sheet" on page 20,

line 16 to 17 should be amended as "into said fiber sheet, said fiber sheet".

(34)The expression "moldability of said porous sheet, said porous sheet" on page 20, line 20 to 21 should be amended as "moldability of said fiber sheet, said fiber sheet".

(35)The expression "said porous sheet" on page 20, line 22 should be amended as "said fiber sheet".

(36)The expression "said porous sheet" on page 20, line 24 should be amended as "said fiber sheet".

(37)The expression "said porous sheet" on page 20, line 28 should be amended as "said fiber sheet".

(38)The expression "[Porous fire resistant sheet (fire resistant fiber sheet)]" on page 19, line 33 should be amended as "[Fire resistant fiber sheet]".

(39)The expression " [Fire resistant expanded synthetic resin sheet] To adhere said fire retardant capsules to said expanded synthetic resin sheet, a method wherein said capsules are mixed into said synthetic resin binder in a case where said synthetic resin binder is coated on or impregnated into said expanded synthetic resin sheet, a method wherein a water dispersion into which said fire retardant capsules are dispersed is coated onto said expanded synthetic resin sheet by spray etc., are applied. Water soluble resin is preferably dissolved in said water dispersion to improve the adherence of said fire retardant capsules to said expanded synthetic resin sheet. Further, in a case where said synthetic resin solution is coated on or impregnated into said expanded synthetic resin sheet, said fire retardant capsule water dispersion is preferably coated before said expandable synthetic resin sheet on which said synthetic resin solution is coated or impregnated into is dried, to adhere said fire retardant capsules strongly to said expanded synthetic resin sheet. Further, in a case where said synthetic resin solution is a water solution, a water soluble resin is preferably added and dissolved in said water solution, to further improve the adherence of said fire retardant capsules to said expanded synthetic resin sheet." on page 21, line 18 to on page 22

line 1 should be deleted.

- (40)The expression "Porous material sheet of the present invention, being such as a fiber sheet, expanded synthetic resin sheet, or the like, is molded into a flat panel or prescribed shape, and to mold said porous sheet" on page 22, line 14 to 16 should be amended as "Fiber sheet of the preset invention is molded into a flat panel or prescribed shape, and to mold said fiber sheet".
- (41)The expression "contained in said porous sheet are heated at a temperature higher than that at which they expand, limiting the thickness of said porous material sheet," on page 22, line 21 to 23 should be amended as "contained in said fiber sheet are heated at a temperature higher than that at which they expand, limiting the thickness of said fiber sheet,".
- (42)The expression "In a case where said porous sheet is fiber sheet," on page 22, line 23 to 24 should be amended as "In a case where of said fiber sheet,"
- (43)The expression "Said porous sheet" on page 22, line 29 should be amended as "Said fiber sheet".
- (44)The expression "A plural number of said porous sheets, such as fiber sheets or expandable synthetic resin sheets, of the present invention" on page 23, line 1 to 2 should be amended as "A plural number of fiber sheets of the present invention".
- (45)The expression "said porous sheet" on page 23, line 10 should be amended as "said fiber sheet".
- (46)The expression "onto said porous sheet, such as fiber sheet, expanded synthetic resin sheet or the like." on page 23, line 33 to 34 should be amended as "on said fiber sheet."
- (47)The expression "other porous material sheet(s) such as fiber sheet" on page 24, line 34 to page 25, line 1 should be amended as "fiber sheet".
- (48)The expression "thermoplastic resin sheet" on page 24, line 3 should be amended as "thermoplastic resin film".
- (49)The expression "said porous material sheet" on page 24, line 26 to 27 should be amended as "said fiber sheet".
- (50)The expression on page 25, line 9 to page 29, line 8,

“EXAMPLE 1

Flame retardant capsules (particle size 15~20 μ m) wherein polyammonium phosphate is covered with melamine resin were mixed into a fiber web consisting of 60% by mass of polyester fiber (fineness: 12dtex, fiber length: 45mm), and 40% by mass of polyester fiber having a low melting point (fineness: 15dtex, fiber length: 40mm), the amount to be added being set to be 5, 20, 40, 60 and 80% by mass per unit weight of said fiber web, and each fiber web was heated to soften said low melting point polyester fiber and bind said fire retardant to said softened polyester fiber, to manufacture a fire resistant fiber sheet having a unit weight of 400g/m² and thickness of 20mm. The resulting fiber sheets were then each heated and molded by cold pressing to obtain molded sheets, each having a thickness of 5 mm.

COMPARISON

Molded sheets were obtained by the same procedure as in EXAMPLE 1 with the exception that the amounts of said fire retardant capsules to be added were set to be 1, 3, 100 and 120% by mass per unit weight of said fiber web. The fire resistant property and appearance of each of the molded sheets obtained in EXAMPLE 1 and COMPARISON 1 were determined and the results are shown in Table 1.

Table 1

	Amount of fire retardant capsules to be added (%)	Fire resistant property UL94	Appearance
EXAMPLE 1	5	V-2	Sheet is soft and has a good appearance.
	20	V-1	"
	40	V-0	"
	60	V-0	"
	80	V-0	Sheet surface is slightly hard.
COMPARISON 1	1	Combustion	Sheet is soft and has a good appearance.
	3	Combustion	"
	100	V-0	Sheet surface is hard and brittle.
	120	V-0	Film of fire retardant is formed on the surface of sheet, and sheet has no fiber feeling.

Referring to Table 1, in a case where the amount of said fire retardant capsules to be added per unit weight of said fiber web is below 5% by mass, the resulting molded sheet has poor fire resistant property and in a case where the amount of said fire retardant capsules to be added per unit weight of said fiber web is beyond 80% by mass, the surface of said molded sheet becomes hard and brittle.

EXAMPLE 2

A fiber web consisting of 75% by mass of polyester fiber (fineness: 13dtx, fiber length: 45mm), and 25% by mass of low melting point polyester fiber (softening point: 130°C, fineness: 12dtex, fiber length: 40mm) was heated to bind said fibers together with said softened low melting point polyester fiber, to prepare a fiber sheet (thickness: 20mm, unit weight: 400gm²). Then a phenol-formaldehyde precondensation polymer solution (solid content: 50% by mass) was coated on and was impregnated into said fiber sheet as a synthetic resin binder with a roll, the amounts to be coated were respectively set to be 5, 10, 50, 100, 150 and 200% by mass.

Fire retardant capsules, wherein trimethyl phosphate was covered with a phenol group resin (particle size: 2 to 5µm) were then scattered onto both sides of each fiber sheet, the amount to be scattered being set to be 20% by mass (10% by mass for one side) per unit weight of said fiber sheet, and then each fiber sheet was heated at 130 to 140°C for 5 minutes, to dry and procure, obtaining a non-flammable fiber sheet on both sides of which fire retardant capsules were attached.

After precuring, each fiber sheet was their molded by hot pressing at 200°C for 60 seconds, obtaining a molded sheet having a thickness of 8 mm.

COMPARISON 2

Molded sheets having a thickness of 8mm were obtained using the same procedure as in EXAMPLE 2, with the exception that the amounts of said phenol-aldehyde precondensation polymer to be coated were set to be 3, 220 and 250% by mass per unit weight of said fiber sheet.

The fire resistance, acoustic absorptivity and ventilation resistance of each molded sheet was determined, and the results are shown in Table 2.

Table 2

	Amount of precondensation polymer to be coated for fiber sheet (%)	Fire resistant property UL94	Acoustic absorptivity (%) (frequency Hz)			Ventilation resistance (kPa·s/m)
			500	1000	6000	
EXAMPLE2	5	V-2	20	45	30	0.1
	10	V-2	25	55	50	1.6
	50	V-1	30	65	95	3.7
	100	V-1	30	75	90	12.3
	150	V-0	30	60	85	38.5
	200	V-0	25	55	60	97.2
COMPARISON1	3	V-2	10	30	20	0.05
	220	V-0	20	35	20	120.7
	250	V-0	5	30	12	153.4

Referring to Table 2, in a case where the amount of said precondensation polymer (binder) to be coated is below 5% by mass, the resulting molded sheet has too little ventilation resistance, also worsening the acoustic absorptivity of said molded sheet in a wide range from low frequency to high frequency, and in a case where the amount of said precondensation polymer (binder) to be coated is 200% by mass, the resulting molded sheet has too high ventilation resistance, worsening the absorptivity of said molded sheet, in the wide range from low to high frequencies.

As mentioned above, acoustic absorptivity can be adjusted by the amount of binder used for coating.

EXAMPLE 3

A treatment solution containing 80 parts by mass of an acrylic resin emulsion (solid content 50% by mass) and 20 parts by mass of fire retardant capsules was prepared, in each capsule ammonium sulfamate being coated with urethane resin and said fire retardant capsules being dispersed in water in an amount of 50% by mass and size of each capsule being 0.5 to 2 μ m.

Said treatment solution was then impregnated into a spun bonded nonwoven fabric made of a low melting point polyester fiber and having a unit weight of 30g/m², the amount of said treatment solution to be coated being set to be 40% by mass as a solid with a polyamide powder (melting point 150°C, particle size 20 to 30 μ m) as a hot melt adhesive powder being scattered onto one side of said nonwoven fabric, the amounts of said polyamide powder to be scattered being set to be 1, 10, 50 and 100g/m², after which each nonwoven fabric was heated at 120 to 130°C for 5 minutes to dry the acrylic resin emulsion in each nonwoven fabric and bind said fire retardant capsules onto

said nonwoven fabric, to obtain non-flammable non woven fabric sheet, on one side of which hotmet adhesive powder being attached.

The resulting nonwoven fabric sheet was then used as a surface material, and a glass wool having a unit weight 800g/m² was used as a base material, with a phenol group resin being coated onto said glass wool in an amount of 15% by mass per unit weight.

Said nonwoven fabric sheet was put onto said base material so as to cause said hot melt adhesive powder layer formed on one side of said nonwoven fabric sheet to contact the surface of said base material, after which said laminated sheet was molded by hot pressing at 210°C for 50 seconds, obtaining a molded sheet having a thickness of 8mm.

COMPARISON 3

A molded sheet having a thickness of 8mm was obtained using the same procedure in EXAMPLE 3 with the exception that the amount of said hot melt adhesive powder to be scattered was set to be 0.5 and 120g/m².

The fire resistant property, acoustic absorptivity, ventilation resistance and interlaminar bonding strength of each molded sheet obtained in EXAMPLE 3 and COMPARISON 3 were each determined, and the results are shown in Table 3.

	Amount of adhesive to be coated (g/m ²)	Fire resistant property UL94	Acoustic absorptivity (%) (frequency Hz)			Ventilation resistance (kPa·s/m)	Bonding strength (N·cm/25mm)
			500	1000	6000		
EXAMPLE 3	1	V-1	25	40	70	0.12	0.12
	10	V-1	30	50	90	1.5	0.18
	50	V-1	30	70	85	7.8	0.20
	100	V-1	28	65	80	75.0	0.30
COMPARISON 3	0.5	V-1	20	40	50	0.08	0.02
	120	V-1	17	35	22	110.0	0.30

Referring to Table 3, in a case where the amount of said hot melt adhesive powder to be scattered is below 1g/m², in COMPARISON 3, the interlaminar bonding strength radically declines, and in a case where the amount of said hot melt adhesive powder to be scattered is beyond 100g/m², the ventilation resistance becomes high, harming acoustic absorptivity." should be deleted.

(51)The expression "EXAMPLE 4" on page 29, line 10 to should be amended as "EXAMPLE 1".

(52)The expression "EXAMPLE 4-1" on page 30, line 4 should be amended as "COMPARISON 1".

(53)The expression "EXAMPLE 4" on page 30, line 6 should be amended as "EXAMPLE 1".

(54)The expression "COMPARISON 4" on page 30, line 11 should be amended as "COMPARISON 2".

(55)The expression "EXAMPLE 4" on page 30, line 13 should be amended as "EXAMPLE 1".

(56)The expression "EXAMPLES 4 and 4-1 and COMPARISON 4" on page 30, line 17 should be amended as "EXAMPLE 1 and COMPARISON 1 and 2".

(57)The expression "shown in Table 4" on page 30, line 17 to 18 should be amended as "shown in Table 1".

(58)The "Table 4" on page 30 should be amended as Table 1 shown as follows:

Table 4 (original)

	Thickness of film (μm)	Fire resistant property UL94	Acoustic absorptivity (%) (frequency Hz)			Ventilation resistance ($\text{kPa}\cdot\text{s/m}$)	Bonding strength ($\text{N}\cdot\text{cm}/25\text{mm}$)
			500	1000	6000		
EXAMPLE 4	10	V-0	30	70	40	0.23	0.12
	50	V-0	40	97	60	7.8	0.18
	100	V-0	40	95	65	20.9	0.20
	200	V-0	35	75	45	95.3	0.30
EXAMPLE 4-1	10	V-1	32	70	40	0.21	0.12
	50	V-1	40	95	60	0.75	0.19
	100	V-1	45	90	65	21.0	0.21
	200	V-1	35	78	45	95.1	0.32
COMPARISON 4	5	V-0	15	60	30	0.008	0.08
	220	V-0	10	60	20	127.0	0.30

Table 1 (Amended)

	Thickness of film (μm)	Fire resistant property UL94	Acoustic absorptivity (%) (frequency Hz)			Ventilation resistance ($\text{kPa}\cdot\text{s/m}$)	Bonding strength ($\text{N}\cdot\text{cm}/25\text{mm}$)
			500	1000	6000		
EXAMPLE 1	10	V-0	30	70	40	0.23	0.12
	50	V-0	40	97	60	7.8	0.18
	100	V-0	40	95	65	20.9	0.20
	200	V-0	35	75	45	95.3	0.30
COMPARISON 1	10	V-1	32	70	40	0.21	0.12
	50	V-1	40	95	60	0.75	0.19
	100	V-1	45	90	65	21.0	0.21
	200	V-1	35	78	45	95.1	0.32
COMPARISON 2	5	V-0	15	60	30	0.008	0.08
	220	V-0	10	60	20	127.0	0.30

(59)The expression "Referring to Table 4" on page 30, line 22 should be amended as "Referring to Table 1".

(60)The expression "each of the molded sheets using non" on page 30, line

28 should be amended as "each of the molded sheets in COMPARISON 1 using non".

(61)The expression "EXAMPLE 5" on page 31, line 4 should be amended as "EXAMPLE 2".

(62)The expression "EXAMPLE 5-1" on page 31, line 23 should be amended as "COMPARISON 3".

(63)The expression "EXAMPLE 5" on page 31, line 25 should be amended as "EXAMPLE 2".

(64)The expression "COMPARISON 5" on page 31, line 30 should be amended as "COMPARISON 4".

(65)The expression "EXAMPLE 5" on page , line 32 should be amended as "EXAMPLE 2".

(66)The expression "EXAMPLE 5, EXAMPLE 5-1, and COMPARISON 5" on page 32, line 2 should be amended as "EXAMPLE 2, and COMPARISONS 3 and 4".

(67)The expression "shown in Table 5" on page32, line 3 should be amended as "shown in Table 2".

(68)The "Table 5" on page 32 should be amended as "Table 2" as follows;

Table 5 (original)

	Fire resistant property UL94	Fire resistant property after water-heat cycle UL94	Acoustic absorptivity (%) (frequency Hz)			Ventilation resistance (kPa·s/m)
			500	1000	6000	
EXAMPLE 5	V-0	V-0	20	64	95	3.9
EXAMPLE 5-1	V-1	V-1	25	65	95	3.8
COMPARISON 5	V-0	Combustion	20	60	80	3.0

Table 2 (Amended)

	Fire resistant property UL94	Fire resistant property after water-heat cycle UL94	Acoustic absorptivity (%) (frequency Hz)			Ventilation resistance (kPa·s/m)
			500	1000	6000	
EXAMPLE 2	V-0	V-0	20	64	95	3.9
COMPARISON 3	V-1	V-1	25	65	95	3.8
COMPARISON 4	V-0	Combustion	20	60	80	3.0

(69)The expression "Referring to Table 5, the molded sheet of COMPARISON 5, in which as compared to the molded sheets of EXAMPLE 5 and EXAMPLE 5-1" on page 32, line 8 to 11 should be amended as "Referring to Table 2, the molded sheet of COMPARISON

4, in which as compared to the molded sheets of EXAMPLE 2 and COMPARISON 3".

(70)The expression "EXAMPLE 6 A fiber web consisting of 60% by mass of polyester fiber (fineness: 6dtex, fiber length: 60mm) and 40% by mass of polypropylene fiber (fineness: 8dtex, fiber length: 45mm) was prepared. Said fiber web was then heated at a temperature higher than that of the melting point of said polypropylene fiber, to prepare a fiber sheet in which said melted polypropylene acts as a binder, the unit weight of said fiber sheet being 1000g/m², with a thickness of 20mm. A treatment solution was prepared by mixing 50parts by mass of "TERRAJU C-60" (trade name: BUDENHEIM IBERICA COMMERCIAL S. A.) as the fire retardant capsules, in an acrylic resin emulsion (solid content 50% by mass). Said treatment solution was then impregnated into said fiber sheet in an amount of 50% by mass per unit weight, and the resulting fiber sheet was then heated and dried at 120 to 130°C for 7 minutes, to obtain a nonflammable fiber sheet. Said fiber sheet was then heated at 200°C for a few minutes, after which it was molded into a prescribed shape using the cold press machine. The fire resistant property of said molded fiber sheet was V-0 in UL94 standard, with a ventilation resistance of 1.6kPa · s/m, said molded sheet having an excellent acoustic absorptivity, water proof property, and weatherability, and was useful as a room partition silencer or head lining of a car" on page 33, line 1 to 21 should be deleted.

(71)The expression "EXAMPLE 7" on page 33, line 23 should be amended as "EXAMPLE 3".

(72)The expression "EXAMPLE 8 A fiber sheet having a unit weight of 80g/m² was prepared by needle punching a fiber web consisting of 65% by mass of a polyester fiber (fineness: 3.5dtex, fiber length: 30mm), 20% by mass of a hollow polyester fiber (hollow ratio: 30%, fineness: 7dtex, fiber length: 50mm) and 15% by mass of a low melting point polyester fiber (softening point:120°C, fineness: 5dtex, fiber length: 50mm). A treatment solution containing 5 parts by mass of a fluorine group water-oil repellant agent (solid content 40% by mass), 50parts

by mass of polyvinyl alcohol (10% by mass solid content water solution, saponification value: 99mol%), and 45parts by mass of water was prepared. Said treatment solution was then impregnated into said fiber sheet in an amount of 10% by mass per unit weight, after which a mixture of 60parts by mass of polyamide hot melt adhesive powder (particle size: 15 μ m, melting point 140°C), and 40parts by mass of "TERRAJU C-80" (trade name: BUDENHEIM IBERICA COMMERCIAL, S. A.) as fire retardant capsules was scattered onto one side of said fiber sheet, the amount of said mixture to be scattered being set to be 20% by mass for per weight, following which said fiber sheet was heated and dried at 145°C for 5 minutes, to bind said fire retardant capsules onto said fiber sheet with said polyvinyl alcohol and hot melt adhesive, to obtain a nonflammable fiber sheet. The resulting fiber sheet was then used as a surface material, and a glass wool web having a unit weight of 400g/m², onto which a phenol resin was coated in an amount of 15% by mass was used as a base material. Said surface material was put onto said base material so that said fire retardant capsules on said surface material contact said base material, the resulting laminated material being molded by hot pressing at 180°C for 60 seconds to obtain a molded laminated material. The fire resistant property of said molded laminated material was V-0 in UL94 standard, with a ventilation resistance of 7.1 kPa·s/m, said molded laminated material having an excellent acoustic absorptivity water proof property, and weatherability, and being useful as a hood silencer, outer dash silencer, dash silencer, and cowl side silencer.

EXAMPLE 9

A molded fiber sheet was prepared using the same procedure as in **EXAMPLE 7**, with the exception that a polyester fiber spun bonded nonwoven fabric, having a unit weight of 40g/m², on one side of which a porous polyethylene film with a thickness of 30 μ m was laminated, said fire retardant capsules being coated onto said polyethylene film, was used in stead of said polyester spunbonded non woven fabric having a unit weight of 40g/m². The fire resistant property of said molded fiber sheet was V-0 in UL94 standard, with a ventilation resistance of 54.5 kPa·s/m, said molded fiber sheet having an excellent

acoustic absorptivity, water proof property, and weatherability, and said molded fiber sheet being useful as a hood silencer or nonflammable sound absorber for domestic electrical appliances and building materials." on page 34, line 19 to page 35 line 31 should be deleted.

(73)The expression "EXAMPLE 10" on page 35, line 33 should be amended as "EXAMPLE 4".

(74)The expression "EXAMPLE 11 A web consisting of 70% by mass of a regenerated fiber, obtained by picking used fiber product such as clothing, car interior, or the like and 30% by mass of polypropylene fiber was prepared. A powder mixture, wherein 80parts by mass of "TERRAJU C-70" (trade name: BUDENHEIM IBERICA COMMERCIAL S. A.) as a fire retardant capsules and 20parts by mass of expandable graphite (temperature to start expansion: 300°C, expansion rate 150times, particle size: 40μm) were uniformly mixed, was mixed into said web. The resulting web into which said powder mixture was mixed, was then heated to soften said polypropylene fiber and bind uniformly said fire retardant capsules and expandable graphite to the fibers in said web with said softened polypropylene fiber to obtain a nonflammable fiber sheet, having a unit weight of 150g/m², and a thickness of 30mm. The resulting nonflammable fiber sheet was then heated and molded into a prescribed shape by cold pressing. The fire resistant property of said molded fiber sheet was V-0 in UL94 standard, with a ventilation resistance of 2.8kPa·s/m, said molded fiber sheet having an excellent acoustic absorptivity, a moisture proof property and weatherability, and being useful as a dash silencer, floor mat, room partition silencer for a car." on page 36, line 26 to page 37 line 11 should be deleted.

(75)The expression "EXAMPLE 12" on page 37, line 11 to should be amended as "EXAMPLE 5".

(76)In the expression "treated with triazine as a fire retardant" on page 37, line 24, one Japanese missing letter (meaning "as") was added.

(77)The expression "obtained in EXAMPLE 10" on page 37, line 31to should be amended as "obtained in EXAMPLE 4".

- (78)The expression "EXAMPLE 13" on page 38, line 5 should be amended as "EXAMPLE 6".
- (79)The expression "EXAMPLE 14" on page 39, line 5 should be amended as EXAMPLE 7".
- (80)The expression "as a softener" on page 39, line 12 should be amended as "as a fire retardant agent".
- (81)The expression "EXAMPLE 15" on page 40, line 15 should be amended as "EXAMPLE 8".
- (82)The expression "from EXAMPLE 14 as a surface material,sheet from EXAMPLE 13" on page 40, line 16 to 17 should be amended as "from EXAMPLE 7 as a surface material, sheet from EXAMPLE 6".
- (83)The expression " and using a fiber sheet" on page 40, line 17 should be amended as "and using a fire resistant fiber sheet".
- (84)The expression "the same as in EXAMPLE 14" on page 40, line 20 should be amended as "the same as in EXAMPLE 7".
- (85)The expression "EXAMPLE 16" on page 40, line 27 should be amended as "EXAMPLE 9".
- (86)The expression "EXAMPLE 17" on page 41, line 32 should be amended as "EXAMPLE 10".
- (87)The expression "material of EXAMPLE 16 was put on the nonflammable fiber sheet from EXAMPLE 13" on page 41, line 33 to 34 should be amended as "material of EXAMPLE 9 was put on the nonflammable fiber sheet from EXAMPLE 6".
- (88)The expression "EXAMPLE 18" on page 42, line 9 should be amended as "EXAMPLE 11".
- (89)The expression "made of polyester polyol" on page 42, line 19 should be deleted.
- (90)The expression "to obtain a nonflammable porous sheet." on page 42, line 24 to 25 should be amended as "to obtain a nonflammable expanded synthetic resin sheet."
- (91)The expression "The resulting porous sheet was" on page 42, line 25 should be amended as "The resulting expanded synthetic resin sheet was".

(92)The expression "COMPARISON 6 A molded porous sheet having a thickness of 8mm was prepared using the same procedure as in EXAMPLE 18" on page 42, line 28 to 29 should be amended as "COMPARISON 5 A molded porous sheet having a thickness of 8mm was prepared using the same procedure as in EXAMPLE 11".

(93)The expression "from EXAMPLE 18 and COMPARISON 6" on page 42, line 32 and 33 should be amended as "from EXAMPLE 11 and COMPARISON 5".

(94)The expression "shown in Table 6" on page 43, line 1 should be amended as "shown in Table 3".

(95)The "Table 6" on page 43, should be amended as "Table 3" as follows:

Table 6 (original)

	Fire resistant property UL94	Fire resistant property after water-heat cycle UL94	Acoustic absorptivity (%) (frequency Hz)			Ventilation resistance (kPa·s/m)
			500	1000	6000	
EXAMPLE 18	V-0	V-0	25	75	98	2.8
COMPARISON 6	V-0	Combustion	28	75	98	2.9

Table 3 (Amended)

	Fire resistant property UL94	Fire resistant property after water-heat cycle UL94	Acoustic absorptivity (%) (frequency Hz)			Ventilation resistance (kPa·s/m)
			500	1000	6000	
EXAMPLE 11	V-0	V-0	25	75	98	2.8
COMPARISON 5	V-0	Combustion	28	75	98	2.9

(96)The expression "Referring to Table 6" on page 43, line 6 should be amended as "Referring to Table 3".

(97)The expression "the sample from COMPARISON 6" on page 43, line 6 should be amended as "the sample from COMPARISON 5".

(98)The expression "the sample from EXAMPLE 17" on page 43, line 8 should be amended as "the sample from EXAMPLE 10".

(99)The expression "EXAMPLE 19" on page 43, line 12 should be amended as "EXAMPLE 12".

(100)The expression "sheet of EXAMPLE 18" on page 43, line 13 should be amended as "sheet of EXAMPLE 11".

(101)The expression "said nonflammable porous sheet" on page 43, line 13 should be amended as "said nonflammable fiber sheet".

(102)The expression "nonflammable porous material sheet

- (nonflammable sheet) from EXAMPLE 8" on page 43, line 14 to 15 should be amended as "nonflammable non-woven sheet from EXAMPLE 3".
- (103)The expression "resistance of 3.6kPa·s/m" on page 43, line 19 should be amended as "resistance of 2.3kPa·s/m".
- (104)The expression "EXAMPLE 20" on page 43, line 24 should be amended as "EXAMPLE 13".
- (105)The expression "nonflammable fiber sheet (a nonflammable porous sheet). A polyurethane foam made of polyetherpolyol" on page 44, line 12 to 13 should be amended as "nonflammable fiber sheet. A polyurethane foam".
- (106)The expression "Said porous sheet such as said fiber sheet, and said synthetic resin foam sheet or the like" on page 45, line 17 to 18 should be amended as "Said fiber sheet".
- (107)The expression "to provide a porous fire resistant sheet.A molded article of the porous fire resistant sheet" on page 48, line 9 to 14 should be amended as "to provide a fire resistant sheet.A molded article of the fire resistant sheet".
- (108)The expression "A porous fire resistant sheet characterized by a synthetic resin film covering fire retardant capsules, causing said fire retardant capsules to adhere to porous material" on page 46 in Claim 1, should be amended as "A fire resistant fiber sheet characterized by fire retardant capsules covered with a synthetic resin film, to adhere said capsules to said fiber sheet, wherein a sulfomethylated and/or sulfimethylated phenolic resin is added to said fiber sheet in an amount of between 5 and 200% by mass".
- (109)The expression "A porous fire resistant sheet in accordance with Claim 1, wherein said fire retardant capsules are added to said porous material in an amount of between 5% and 80% by mass" on page 46, in Claim 2 should be amended as "A fire resistant fiber sheet in accordance with Claim 1, wherein said fire retardant capsules are added to said fiber sheet in an amount of between 5% and 80% by mass".
- (110)The expression "A porous fire resistant sheet in accordance with

Claim 1, wherein said fire retardant is water soluble and said synthetic resin film is water insoluble" on page 46, in Claim 3 should be amended as "A fire resistant fiber sheet in accordance with Claim 1, wherein said flame retardant is water soluble and said synthetic resin film is water insoluble".

- (111) "A porous fire resistant sheet in accordance with Claim 1, wherein said porous material is fiber." on page 46 of Claim 4 should be deleted.
- (112) The expression "A porous fire resistant sheet in accordance with any of Claims 1 to 4, wherein said fibers are all hollowed, or a mixture of solid and hollowed fibers" on page 46 in Claim 5 should be amended as "A fire resistant fiber sheet in accordance with any of Claims 1 to 3, wherein said fibers are all hollowed, or a mixture of solid and hollowed fibers".
- (113) The expression "A porous fire resistant sheet in accordance with any of Claims 1 to 5, wherein an additional fiber having a low melting point of below 180°C are mixed in with said fiber" on page 46, in Claim 6 should be amended as "A fire resistant fiber sheet in accordance with any of Claims 1 to 5, wherein an additional fiber having a low melting point of below 180°C is mixed in with said fiber".
- (114) Claims 7 to 15 on page 46 and 47 should be deleted
- (115) The expression "A molded article wherein said porous fire resistant sheet, in accordance with any of Claims 1 to 15, is molded into a prescribed shape" on page 47, in Claim 16 should be amended as "A molded article wherein said fire resistant fiber sheet in accordance with any of Claims 1 to 6, is molded into a prescribed shape".
- (116) The expression "one or both sides of said porous fire resistant sheet in accordance with any of Claims 1 to 15" on page 47, in Claim 18 should be amended as "one side or both sides of said fire resistant fiber sheet in accordance with any of Claims 1 to 5".
- (117) The expression "one or both sides of said porous fire resistant sheet(s)" on page 47, line 17 to 18 in Claim 19 should be amended as "one or both sides of said fire resistant fiber sheet".

(118)The expression "A laminated material in accordance with Claim 19, wherein a hot melt adhesive powder is scattered onto one or both sides of said porous fire resistant sheet in an amount of between 1 and 100g/m², and said other porous material sheet(s) is (are) laminated onto said porous sheet through said scattered layer of hot melt adhesive powder" on page 47, in Claim 20 should be amended as "A laminated material in accordance with Claim 19, wherein a hot melt adhesive powder is scattered onto one or both sides of said fire resistant fiber sheet in an amount of between 1 and 100g/m² and said other porous material sheet(s) is (are) laminated onto said fiber sheet through said scattered layer of hot melt adhesive powder".

(119)In the expression "A molded article wherein a laminated material in accordance with Claim 18 or 19 is molded into a prescribed shape" on page 47 in Claim 21, one missing Chinese character in the word meaning "Claim" is added.

6. List of attached documents

(1) Replacement sheets of page 1-3,4,6,8-10,13,15,16,19-48 of Specification